DFBX Instrumentation Duct Installation

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REVISION LOG

1. PURPOSE

The purpose of this document is to identify the steps that must be followed by the DFBX Subcontractor to properly install the LBNL-supplied DFBX instrumentation ducts. The ducts are loaded with wires for connection to the US-supplied superconducting magnet diagnostics. This hardware is included in the List of Government Furnished Materials, Section 8 of the DFBX Technical Specification, LBNL Document M993.

2. SCOPE

This document applies to the bus duct assemblies designated as MQX2 and MBX2. The MQX2 assemblies are used in all 8 DFBX, whereas the MBX2 are used in DFBX models C,D, G, and H.

3. REFERENCE DOCUMENTS

3.1 LBNL Drawings

24C352 – DFBXG Feed Box Assembly
25I301 – Pipe, MQX2 ***Note: The drawing will be modified to show protective caps***
25I219 – Pipe, MBX2 ***Note: The drawing will be modified to show protective caps***
25I831 - LQX Diagnostic Assembly
25I163 - LBX Diagnostic Assembly
25I619 - DFBXG Wiring Diagrams
25I833 - Base
25I185 - Body, LBX Diagnostic
25I835 - Ceramaseal Seat Assembly
25I366 - Ceramaseal 7-pin Assembly

3.2 LBNL Documents

M989 - DFBX Acceptance Test
M993 - DFBX Technical Specification

4. SUBCONTRACTOR ACTIVITIES

The following list of tasks shall be performed by the DFBX Subcontractor.

4.1 Incoming Inspection and Acceptance Testing

4.1.1. Uncrate and make sure traveler is completely filled out.
4.1.2. Check for obvious damage to the assembly. If there is no apparent damage, proceed to step 4.1.5.
4.1.3. Perform vacuum leak check of conduit with wires.
4.1.4. Perform hipot and continuity test of the wires in air.

4.1.5. Repack and place in secure storage.

4.2 Installation

4.2.1. Remove required assembly from storage.
4.2.2. Enter serial number of assembly in DFBX traveler.
4.2.3. Remove the protection tube clamp (KF50) and temporarily hold the tube in place with tape.
4.2.4. Insert the duct assembly into the hole in the DFBX top plate from the underside of the top plate.
4.2.5. Align to proper position as shown on drawing 24C352.
4.2.6. Seal weld the assembly to the top plate.
4.2.7. Re-install the clamp that was removed in 4.2.3. (To allow the weld made in 4.2.5 to be leak checked.)
4.2.8. Install a leak-check tool over the protruding protection tube and seal it to the DFBX top plate with a sticky vacuum bagging seal material.
4.2.9. Leak check the 4.2.5 weld by connecting the leak check tool to a leak detector and applying helium gas to the underside of the weld flange. *Leak rate to be less than $1x10^{-10}$ atm-cc/s.*
4.2.10. Remove the leak check tool.
4.2.11. Remove the clamp from the protective pipe and replace with tape to hold the pipe in place.
4.2.12. Position the feedthrough assembly (25I831 for MQX2 and 25I163 for MBX2) in position and match mark the base with the top plate so the assembly will have the proper orientation.
4.2.13. Weld the feedthrough base in position. (25I833 for MQX2 and 25I185 for MBX2).
4.2.14. Remove the protective pipe and separate the wires according to their intended pin location as shown on drawing 25I619. Drawings 25I835 and 25I366 show the high voltage pins for the MQX2 and MBX2, respectively.
4.2.15. For the LQX assembly, wind the bundles for feedthrough holes A through L counterclockwise 4 twists and insert the bundle through the appropriate hole in the feedthough assembly. Screw the upper assembly into the base and make the lip seal weld.
4.2.16. For the LBX assembly, pull the bundles through their intended holes and seal weld the top plate in place with the proper orientation.
4.2.17. Solder the wires to their respective pin, according to drawing 26I619. Perform a continuity check to verify proper connection. *Traveler Item.*
4.2.18. Encapsulate the soldered connections with de-aired Stycast 2850MT(blue) or LBNL-approved substitute to provide electrical standoff and mechanical support to the connections. Allow the encapsulant material to cure.

4.2.19. Install the feedthroughs in position and tack weld to maintain position.
4.2.20. Seal weld the feedthroughs to the assembly.
4.2.21. Hipot the pins in accordance with the DFBX Acceptance Specification, LBNL Document M989. Disassemble and repair the ones that do not pass.
4.2.22. Pressure test and leak check per LBNL Acceptance Procedure M989.